

Answer Ex-I**SINGLE CORRECT (OBJECTIVE QUESTIONS)**

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|-------|-------|-------|-------|-------|-------|-------|
| 1. C | 2. D | 3. C | 4. B | 5. A | 6. D | 7. B |
| 8. C | 9. A | 10. D | 11. B | 12. B | 13. A | 14. D |
| 15. D | 16. A | 17. C | 18. A | 19. C | 20. B | 21. C |
| 22. A | 23. B | 24. C | 25. A | 26. C | 27. A | 28. C |
| 29. C | 30. C | 31. D | 32. D | 33. D | 34. C | 35. A |
| 36. A | 37. C | 38. C | 39. D | 40. B | 41. B | 42. D |
| 43. C | 44. D | 45. C | 46. B | 47. C | 48. B | 49. C |
| 50. C | 51. A | 52. A | 53. B | 54. B | 55. C | 56. A |
| 57. A | 58. A | 59. B | 60. A | 61. D | 62. B | 63. A |
| 64. A | 65. B | | | | | |

Answer Ex-II**MULTIPLE CORRECT (OBJECTIVE QUESTIONS)**

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| 1. B,C,D | 2. A,C,D | 3. A,C | 4. A,D | 5. A,B | 6. A,B,C,D | 7. A,B,C |
| 8. B,D | 9. A,B | 10. A,D | 11. A,C,D | 12. A,C,D | 13. A,D | 14. A,D |
| 15. B,D | 16. A,B,C,D | 17. A,B,C | | | | |

Answer Ex-III**SUBJECTIVE QUESTIONS**

2. OP : PD = 3 : 2 4. $\vec{r} = (\hat{i} + 2\hat{j} + 3\hat{k}) + \lambda(\hat{j} - \hat{k})$
5. (i) $-\hat{i} + \hat{j} + \hat{k}$ (ii) $\frac{6}{\sqrt{19}}$ (iii) $6\hat{i} - \hat{j} + \hat{k}$ (iii) $\frac{2\pi}{3}$ 6. (i) 60° 7. (i) $3(-\hat{i} - \hat{j} + \hat{k})$ (ii) 16
8. $\frac{6}{\sqrt{5}}$ unit 9. (i) $\sin a \cos a$ (ii) $\frac{\sqrt{3}}{2}$ 10. (i) $p = 0$; $q = 10$; $r = -3$ (ii) -100
11. $\vec{x} = \vec{q} - \frac{(\vec{p} \cdot \vec{q})\vec{p}}{2|\vec{p}|^2}$ 12. (i) No (ii) Yes 13. 3 14. $\vec{r} \cdot (4\hat{i} - 2\hat{j} - 5\hat{k}) = 45$
15. $\frac{5}{3}$ unit 18. (i) $\vec{R} = -\hat{i} - 8\hat{j} + 2\hat{k}$ (ii) $9(-\hat{j} + \hat{k})$ 19. $\vec{r} = \left(\frac{6}{13}\hat{i} + \frac{5}{13}\hat{j}\right) + \lambda(-2\hat{i} + 7\hat{j} + 13\hat{k})$
22. $19/8\hat{i} + 11/8\hat{j} + 19/8\hat{k}$ 25. $\tan \theta = \frac{2}{\sqrt{89}\sqrt{41}}$ 26. $\tan^{-1} \frac{5}{2}$ 27. $(2\hat{i} + 2\hat{j} - \hat{k}) \cdot \vec{r} = 3$ 28. 9

Answer Ex-IV**ADVANCED SUBJECTIVE QUESTIONS**

1. $x = 2, x = -1$ 2. (b) externally in the ratio 1 : 3
4. (i) parallel (ii) the lines intersect at the point p.v. $-2\hat{i} + 2\hat{j}$ (iii) lines are skew
5. 2 : 1 6. 9 9. 34 12. $-\hat{i} + 2\hat{j} + 5\hat{k}$ 13. $\frac{5a^2}{12\sqrt{3}}$ sq. units 14. $2\sqrt{17}$
15. $\pm \frac{1}{3\sqrt{3}} (\hat{i} + 5\hat{j} - \hat{k})$ 17. (i) $\frac{6}{7}\sqrt{14}$ (ii) 6 (iii) $\frac{3}{5}\sqrt{10}$ (iv) $\sqrt{6}$ 18. $\frac{11}{\sqrt{170}}$
19. $\frac{4}{\sqrt{2}}\hat{i} - \frac{1}{\sqrt{2}}\hat{j} - \frac{1}{\sqrt{2}}\hat{k}$ 20. p.v. of $\vec{R} = r = 3\hat{i} + 3\hat{k}$ 23. $\alpha = n\pi + \frac{(-1)^n\pi}{2}, n \in \mathbb{I} \ \& \ \beta = 1$
24. 110 26. $\alpha = 2/3$; if $\alpha = 0$ then vector product is $-60(2\hat{i} + \hat{k})$ 27. $9(-\hat{j} + \hat{k})$
29. $F = 2\vec{a}_1 + 5\vec{a}_2 + 3\vec{a}_3$ 31. (b) $\left\{ \vec{p} = \frac{[\vec{a}\vec{b}\vec{c}]}{(\vec{a} \cdot \vec{c})(\vec{a} \cdot \vec{b})}(\vec{a} + \vec{c} \times \vec{b}) + \frac{(\vec{b} \cdot \vec{b})\vec{b}}{(\vec{a} \cdot \vec{b})} - \frac{(\vec{b} \cdot \vec{b})\vec{c}}{(\vec{a} \cdot \vec{b})} \right\}$

Answer Ex-V**JEE PROBLEMS**

1. (a) (i) B (ii) A (iii) A 2. (i) $\pm \hat{i}$; (ii) $\frac{\vec{b}}{b^2} + \frac{\vec{a} \times \vec{b}}{(\vec{a} \times \vec{b})^2}$; (iii) $\frac{2\pi}{3}$
3. (a) $\frac{1}{2}(5\hat{i} - \hat{j} - 7\hat{k}), \frac{1}{2}(-\hat{i} + 7\hat{j} - 5\hat{k}) ; \frac{1}{2}\sqrt{1274}$ sq. units (b) $\lambda = 0, \lambda = -2 \pm \sqrt{29}$
4. (a) $\vec{r} = -13\hat{i} + 11\hat{j} + 7\hat{k}$; (b) $\frac{5}{7}\hat{i} + \frac{17}{7}\hat{j}$ 5. (a) B (b) C 7. (a) B ; (b) C
9. D 12. (a) B, (b) A 13. $\hat{w} = \hat{v} - 2(\hat{a} \cdot \hat{v})\hat{a}$ 14. (a) A ; (b) B
15. (a) C ; (b) B ; (c) C 16. (a) A ; (b) A
17. (a) C ; (b) (A)–Q, S ; (B)–P, R, S, T ; (C)–T ; (D)–R 18. A
19. 5 20. B